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Report to Congressional Requesters

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April 1990

NUCLEAR HEALTH AND SAFETY

Status of GAO's Environmental, Safety, and Health Recommendations to DOE

GAO/RCED-90-125

GAO

United States
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Resources, Community, and
Economic Development Division

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April 20, 1990

The Honorable Howard M. Metzenbaum
United States Senate

The Honorable George Miller
House of Representatives

On March 15, 1989, you requested that we evaluate the Department of Energy's (DOE) progress made in resolving the many environmental, safety, management, and health problems identified at its contractor-operated sites throughout the country. As agreed with your offices, this report provides information on the status of our recommendations made to DOE during the 1980s concerning environmental, safety, and health matters relating to its nuclear weapons complex.[1]

Results in Brief

In over 60 reports and testimonies published since 1980, we have called attention to the mounting problems facing DOE's nuclear weapons complex. This body of work includes (1) identifying serious, costly, and widespread environmental, safety, and health problems at DOE facilities, (2) calling for outside independent oversight of DOE's nuclear operations, and (3) making recommendations to DOE to strengthen its oversight, providing more detailed information and plans to the Congress, and improving its management and accounting practices.

In total, our reports and testimonies have included 54 recommendations to DOE, in addition to recommendations to the Congress, concerning environmental, safety, and health matters at the complex. We consider 23 of the 54 recommendations to be still open. The open recommendations call for improvements such as tighter program controls and clearer standards and policies related to environmental, safety, and health matters.

Background

DOE's operations are carried out at many contractor-operated sites around the country, including major sites within the nuclear weapons complex that are involved in the production of nuclear material for weapons and naval fuel. At these sites DOE contractors routinely use and generate large quantities of a wide range of hazardous and radioactive materials. Because these materials require special handling by workers

[1]Also pursuant to your Mar. 15, 1989, request, we provided you a report entitled Nuclear Health and Safety: Need for Improved Responsiveness to Problems at DOE Sites (GAO/RCED-90-101, Mar. 28, 1990).

to prevent exposure to themselves or releases into the environment, DOE's weapons complex, considered in its entirety, is among the potentially more dangerous industrial operations in the world. Over the last decade, at the request of the Congress, we have carried out a series of assessments and evaluations of various aspects of the complex.

Impact of GAO's Work Concerning the Weapons Complex

Since 1980, we have issued over 60 reports and testimonies identifying important problems and evaluating programmatic issues related to environmental, safety, and health matters at sites in DOE's nuclear weapons complex. Collectively, these reports and testimonies have contributed to congressional understanding and the national debate about the problems surrounding the complex. More specifically, we have

- identified and described serious, costly, and widespread environmental, safety, and health problems at numerous DOE facilities;
- called for outside independent oversight of DOE's nuclear operations; and
- made recommendations to DOE aimed at strengthening environmental, safety, and health oversight; providing more detailed information and plans to the Congress concerning the magnitude and resolution of DOE's environmental, safety, and health problems; and improving DOE's management and accounting practices as they relate to these problems.

During the early 1980s, DOE disputed some of our findings and recommendations, denying that the problems were as serious as we indicated. However, within the past few years the seriousness of the situation facing DOE's facilities has come sharply into focus. We have identified and described in our reports (1) environmental contamination at some DOE sites, (2) important safety problems associated with DOE's production reactors, and (3) the overall deteriorating condition of the nuclear weapons complex. Further, to put the enormity of these problems in perspective, we reported in July 1988 that the cost to rebuild and clean up the complex, while still uncertain, could total up to $155 billion.[2]

Although DOE now acknowledges that it faces a massive cleanup and modernization effort, our 1988 transition report pointed out that the Department must overcome serious credibility problems.[3] For example, it needs to emphasize to line managers their responsibility and accountability for dealing with safety and environmental problems while also

[2]Nuclear Health and Safety: Dealing With Problems in the Nuclear Defense Complex Expected to Cost Over $100 Billion (GAO/RCED-88-197BR, July 6, 1988).

[3]Energy Issues (GAO/OCG-89-16TR, Nov. 1988).

strengthening its internal capability for ensuring that the problems are being identified and resolved.

We have encouraged important programmatic changes for the complex. For example, we consistently called for outside independent oversight of DOE operations to help assure the public that DOE's facilities are operating safely and that the Department has a credible safety review process. DOE initially disagreed with the need for such oversight. However, the Congress, recognizing the need, directed in 1988 establishment of the Defense Nuclear Facilities Safety Board to oversee facilities within the complex. Board members were appointed in 1989. Additionally, we have focused attention on DOE's funding priorities for various programs. For example, in 1989 we questioned the need for DOE building a special isotope separation facility costing $500 million.[4] DOE disagreed with our views, but the Congress has moved to prevent funding of its construction, and DOE has since announced that it will close out the program.

Status of Recommendations

Our reports since 1980 have made 54 specific recommendations to DOE on various environmental, safety, and health matters relating to the nuclear weapons complex. In addition, we have made recommendations to the Congress on departmental environmental, safety, and health issues. The recommendations directed at DOE as the overseer of the complex have called for, among other things, broad planning, programmatic, and management changes within the Department. We have also made recommendations calling for DOE to correct specific problems at sites and facilities around the country. While directed at DOE, many of the recommendations are also relevant to the operating contractors at the individual sites.

Actions Taken by DOE in Response to Our Recommendations

DOE has taken corrective actions on most of our recommendations. Of the 54 recommendations we made in the 1980s, we consider 31 (57 percent) closed—that is, DOE took actions that substantially, if not entirely, fulfilled the intent of the recommendation. Examples of some of the more significant DOE actions that are responsive to our recommendations are as follows:

[4]GAO's Views on Modernizing and Cleaning Up DOE's Nuclear Weapons Complex (GAO/T-RCED-89-9, Feb. 21, 1989).

- establishing within DOE an Office of Assistant Secretary of Environment, Safety, and Health to oversee DOE's operations,
- completing safety analysis reports for all high hazard facilities,
- issuing an overall strategic plan for DOE's nuclear weapons complex,
- improving DOE's accounting and budgeting for environmental funding, and
- allowing independent inspections of DOE mixed waste operations.[6]

These and other actions taken on our recommendations should result in a higher degree of DOE sensitivity to environmental, safety, and health matters.

Actions Needed on Open Recommendations

Although DOE has undertaken corrective actions on most of our 54 recommendations, we still consider 23 of them (43 percent) open because corrective actions either have not been substantially completed or do not adequately address the identified problem. The open recommendations call for various improvements such as tighter program controls and clearer standards and policies related to environmental, safety, and health matters. Fifteen of the open recommendations were made in 1989, 11 of which were in the last quarter of the year.

However, some of our recommendations have been open for several years. For example, in 1986 we recommended that DOE establish a groundwater and soil protection strategy to protect the environment at and around its many field sites throughout the country.[7] This recommendation is still open because although DOE has drafted a strategy it has not yet finalized it. In addition, two 1985 recommendations remain open: (1) making radiological monitoring guides mandatory for all DOE facilities and (2) developing coordinated, independent verification of contractor-reported radiological data.[8] DOE has taken some action on these two recommendations, but its efforts have been delayed several times. As a result, we still consider these recommendations open.

[5]This position has not yet been legislatively established as we recommended to the Congress.

[6]Mixed waste is a combination of hazardous and radioactive waste.

[7]Nuclear Energy: Environmental Issues at DOE's Nuclear Defense Facilities (GAO/RCED-86-192, Sept. 8, 1986).

[8]Environment, Safety, and Health: Environment and Workers Could Be Better Protected at Ohio Defense Plants (GAO/RCED-86-61, Dec. 13, 1985).

We expect that DOE will make progress to close out some additional recommendations during the first quarter of 1990. For example, in 1989 we made a number of recommendations to DOE regarding restructuring its award fee process to ensure that awards given to contractors adequately reflect their environmental, safety, and health performance.[9] DOE has taken steps to restructure its award process, and we expect to close out all of these recommendations in the near future. Once these recommendations are fully implemented, we expect that the revised award fee process will not only more accurately reflect the contractor's performance but will also likely save the government millions of dollars. The status of all of our open recommendations to DOE on environmental, safety, and health matters related to the nuclear weapons complex is shown in appendix I.

Conclusions

Three important results stem from our work during the 1980s. First, DOE now recognizes the serious environmental, safety, and health problems within the nuclear weapons complex and is planning corrective measures. Second, the Congress has established a Defense Nuclear Facilities Safety Board to oversee operations within the complex. Third, DOE has instituted a number of changes in its way of doing business—such as better highlighting environmental funding in the budget—that should result in a higher degree of sensitivity to environmental, safety, and health matters.

Nevertheless, DOE faces a massive, long-term effort in correcting past problems and bringing the complex into full compliance with all environmental, safety, and health laws and regulations. Many improvements recommended by us and others still need to be addressed. Further, new issues will likely be raised as DOE moves forward in cleaning up and modernizing the complex. Accordingly, we will continue to monitor and review DOE's operations to help ensure that they are carried out in a safe and environmentally acceptable manner.

To develop the information for the report, we examined data on the status of our environmental, safety, and health recommendations made to DOE during the 1980s concerning its nuclear weapons complex. Relying on data from our internal recommendation tracking system, DOE's audit

[9]Nuclear Health and Safety: DOE's Award Fees at Rocky Flats Do Not Adequately Reflect ES&H Problems (GAO/RCED-90-47, Oct. 23, 1989) and Hazardous Waste: Contractors Should Be Accountable for Environmental Performance (GAO/RCED-90-23, Oct. 30, 1989).

recommendation tracking system, and other GAO and DOE documents—along with discussions with GAO and DOE officials—we compiled a list of our recommendations on environmental, safety, and health matters relating to the complex and updated their status.

We discussed the information presented in this report with DOE officials—who generally agreed with how we portrayed the status of our recommendations to DOE—and incorporated their views as appropriate. As you requested, however, we did not obtain official agency comments on a draft of the report. This work was performed between November 1989 and January 1990.

Unless you publicly announce its contents earlier, we plan no further distribution of this report for 30 days from the date of this letter. At that time we will send copies to the Chairman, Senate Committee on Governmental Affairs; the Chairman, Environment, Energy and Natural Resources Subcommittee, House Committee on Government Operations; the Secretary, DOE; and other interested parties. If you have any questions regarding this report, please call me at (202) 275-1441. Major contributors to this report are listed in appendix II.

Victor S. Rezendes
Director, Energy Issues

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	Department of Energy
ES&H	environmental, safety, and health
GAO	General Accounting Office
RCED	Resources, Community, and Economic Development Division
RCRA	Resource Conservation and Recovery Act

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DOE's Nuclear Weapons Complex: Status of Open GAO Environmental, Safety, and Health Recommendations

Nuclear Health and Safety: Better Earthquake Protection Needed at DOE's Savannah River Site (GAO/RCED-90-24, Dec. 26, 1989)

1. Establish a comprehensive, systematic seismic program for the reactors and other high-risk facilities at Savannah River.

Status: DOE has not yet formally responded to the recommendation but is planning to implement such a program over the next several years.

2. Conduct an examination to determine the need to upgrade seismic programs at DOE locations with high-risk nuclear facilities.

Status: DOE has not yet formally responded to the recommendation.

Nuclear Health and Safety: Savannah River's Unusual Occurrence Reporting Program Has Been Ineffective (GAO/RCED-90-53, Dec. 20, 1989)

3. Require the Savannah River Operations Office to establish formal written procedures for (1) reviewing and analyzing the contractor's internal reports and (2) evaluating the contractor's internal reporting system to ensure that it is compatible with the objectives of DOE's Unusual Occurrence Reporting program.

Status: DOE has not yet formally responded to the recommendation.

4. Revise DOE's Unusual Occurrence Reporting order to more clearly specify which reactor-related events should be reported to DOE headquarters as unusual occurrences.

Status: DOE has not yet formally responded to the recommendation. A revised order is in process.

Nuclear Waste: Storage Issues at DOE's Waste Isolation Pilot Plant in New Mexico (GAO/RCED-90-1, Dec. 8, 1989)

5. Provide the Congress with technical justification for storing waste in the Waste Isolation Pilot Plant, including the quantity of such waste, in advance of determining if the facility can be used as a repository.

Status: DOE has not yet formally responded to the recommendation.

6. Provide the Congress with contingency plans for disposing of wastes stored in the Waste Isolation Pilot Plant in the event that DOE eventually determines that the facility does not meet disposal standards.

Status: DOE has not yet formally responded to the recommendation.

7. Provide the Congress with options for continued waste storage at other DOE facilities while DOE is completing its assessment of the Waste Isolation Pilot Plant's compliance with the standards.

Status: DOE has not yet formally responded to the recommendation.

Nuclear Health and Safety: DOE's Award Fees at Rocky Flats Do Not Adequately Reflect ES&H Problems (GAO/RCED-90-47, Oct. 23, 1989)

8. Ensure that there is reasonable balance between production and environmental, safety, and health (ES&H) performance in the award process. Further, if awards are to be given for accomplishing specific objectives, ensure that such objectives do not conflict with ES&H objectives.

Status: DOE has taken steps to ensure a more reasonable balance in the process, but further steps are needed to implement the latter part of the recommendation.

9. Restructure the award process to reduce the level of discretion exercised in making a final award fee determination.

Status: DOE now requires that headquarters review all award fee plans, which it believes reduces the discretion of field office contract administrators, and is considering providing field offices with further guidance on use of the award fee process—which may reduce their discretion further.

Hazardous Waste: Contractors Should Be Accountable for Environmental Performance (GAO/RCED-90-23, Oct. 30, 1989)

10. Initiate a rulemaking to revise DOE's current policy and practice of paying for penalties, settlement payments, and legal costs incurred by its contractors. Recognizing that there may be limited circumstances warranting such payment, the revised policy should include criteria that detail when such payments should or should not be allowed.

Status: DOE has published a draft rulemaking for comment and hopes to soon finalize the rulemaking.

11. Initiate, along with the Secretary of Defense, a rulemaking to revise regulations to require all award-fee contracts to include environmental performance as a distinct evaluation area.

Status: DOE has issued a departmental notice requiring more attention to ES&H performance in evaluations but believes a rulemaking is not necessary.

Nuclear Waste: DOE's Management of Single-Shell Tanks at Hanford, Washington (GAO/RCED-89-157, July 18, 1989)

12. Conduct a data-gathering program sufficient to assess the risks and extent of groundwater contamination from tank leaks of mobile, nonradioactive contaminants and mobile, long-lived radioactive substances.

Status: Tank sampling and groundwater well drilling are planned but have not yet begun.

13. Assign appropriate resources and priority to the single-shell tank pumping program to ensure that (1) at a minimum, all feasibly pumpable liquid is removed from the tanks by 1996 and (2) the 1996 goal is not used to delay removal of liquid that could be pumped before 1996.

Status: DOE plans to complete these pumping activities by the end of fiscal year 1996.

14. Develop specific plans to replace the gravel surfaces at tank farms with a less permeable material and promptly replace the gravel surfaces if ongoing studies indicate that these surfaces could promote the movement of waste toward the groundwater.

Status: A DOE engineering study to support the planning GAO recommends is ongoing and expected to be completed in fiscal year 1990.

GAO's Views on DOE's New Production Reactor Selection Process (GAO/T-RCED-89-46, May 24, 1989)

15. DOE should, prior to reaching a final decision on the new production reactors, now scheduled for late 1991, provide the Congress with an in-depth analysis of the schedule, costs, and benefits of each option.

Status: DOE has not yet provided this analysis but plans to do so before reaching a decision.

Nuclear Health and Safety: DOE Needs to Take Further Actions to Ensure Safe Transportation of Radioactive Materials (GAO/RCED-88-195, Sept. 27, 1988)

16. Promptly develop written guidance for addressing and resolving safety-related concerns raised about the packages used to ship nonweapons, high-level radioactive materials, as authorized by DOE Order 5480.3. This guidance should include provisions for approving the continued use of these packages by an organization that does not manage their use.

Status: Despite several GAO contacts on the recommendation, DOE has not yet formally responded to the recommendation. The required response is over a year overdue. According to DOE, a response has been drafted, but it is unclear when it might be finalized.[1]

17. Promptly conduct an independent review of all available documentation to ensure that nuclear weapons package designs meet all applicable safety regulations.

Status: Same as recommendation 16.

18. Assign responsibility for certifying nuclear weapons packages to the centralized certification office at DOE headquarters, as was done for DOE's nonweapons packages.

Status: Same as recommendation 16.

Nuclear Health and Safety: Oversight at DOE's Nuclear Facilities Can Be Strengthened (GAO/RCED-88-137, July 8, 1988)

[1]On Mar. 20, 1990, as this report was being finalized for issuance, DOE provided an official response to recommendations 16, 17 and 18. We are presently considering the response.

19. Revise DOE orders to establish meaningful safety standards and implementation policies to guide continued operation of existing facilities and to use as baseline safety criteria for developing its future strategy for the defense complex. This revision should include a formal process to (1) clearly identify the commercial standards, guides, and codes that should be applied to DOE's nuclear facilities and (2) justify when a standard is not met.

Status: Revised orders are in various stages of development. All were planned for completion during 1989 and 1990 but are being delayed indefinitely by DOE's realignment of responsibilities for nuclear safety policy development.

Nuclear Energy: Environmental Issues at DOE's Nuclear Defense Facilities (GAO/RCED-86-192, Sept. 8, 1986)

20. Develop an overall groundwater and soil protection strategy to provide the public and the Congress a better perspective on the environmental risks and impacts associated with operating DOE's nuclear defense facilities.

Status: DOE has drafted a strategy paper and applicable DOE notice, both of which it expects to finalize in the third or fourth quarter of 1990.

Nuclear Safety: Safety Analysis Reviews for DOE's Defense Facilities Can Be Improved (GAO/RCED-86-175, June 15, 1986)

21. Develop more consistent requirements to be followed in preparing safety analysis reports, outlining appropriate methodologies and assumptions to be used in analyzing accidents and their consequences.

Status: Draft requirements are still under DOE's review, and DOE hopes to finalize them during 1990.

Environment, Safety, and Health: Environment and Workers Could Be Better Protected at Ohio Defense Plants (GAO/RCED-86-61, Dec. 13, 1985)

22. Require that radiological monitoring guides be mandatory for all DOE facilities.

Status: A new DOE order on environmental radiological protection was issued on Feb. 8, 1990. DOE expects an order on monitoring and surveillance to be issued in fiscal year 1990.

23. Develop a coordinated DOE/state/contractor system to independently verify contractor-reported environmental monitoring data.

Status: DOE is negotiating with 10 states to implement this recommendation, expecting to complete negotiations by the end of March 1990.

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